Observations of T Tauri stars with infrared interferometry

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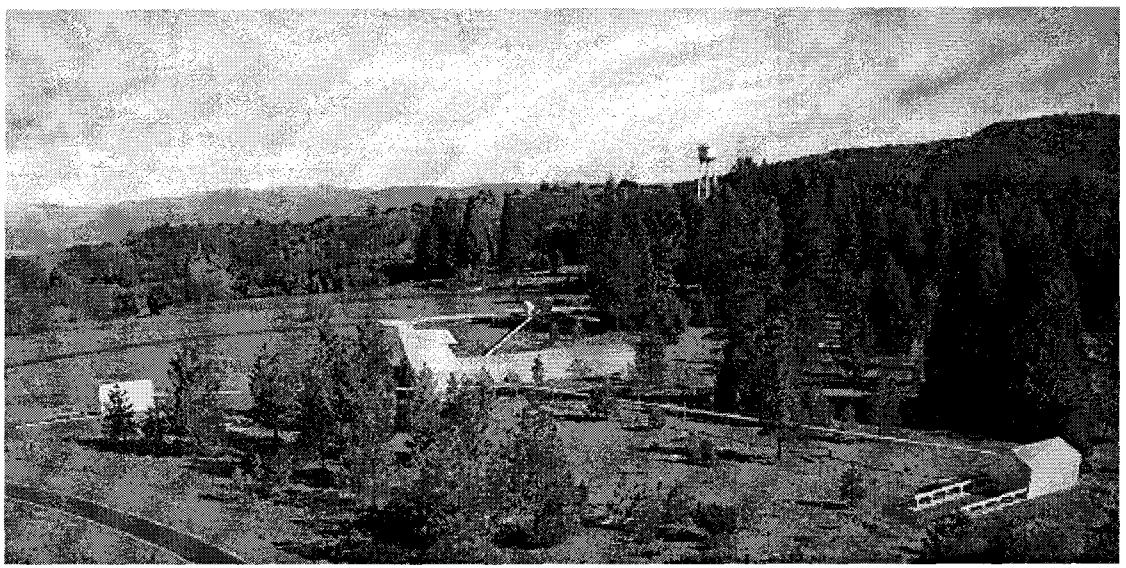
Palomar Testbed Interferometer

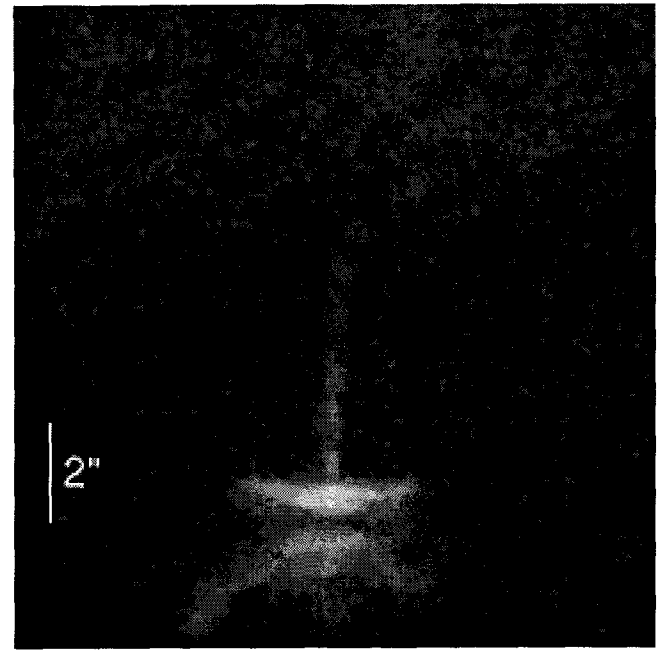


- Visibility amplitude measurements
  - K band
  - 2 baselines: 110 and 85 meters
  - Data presented as calibrated and normalized squared visibility (unresolved object has $V^2 = 1$)

T Tauri stars

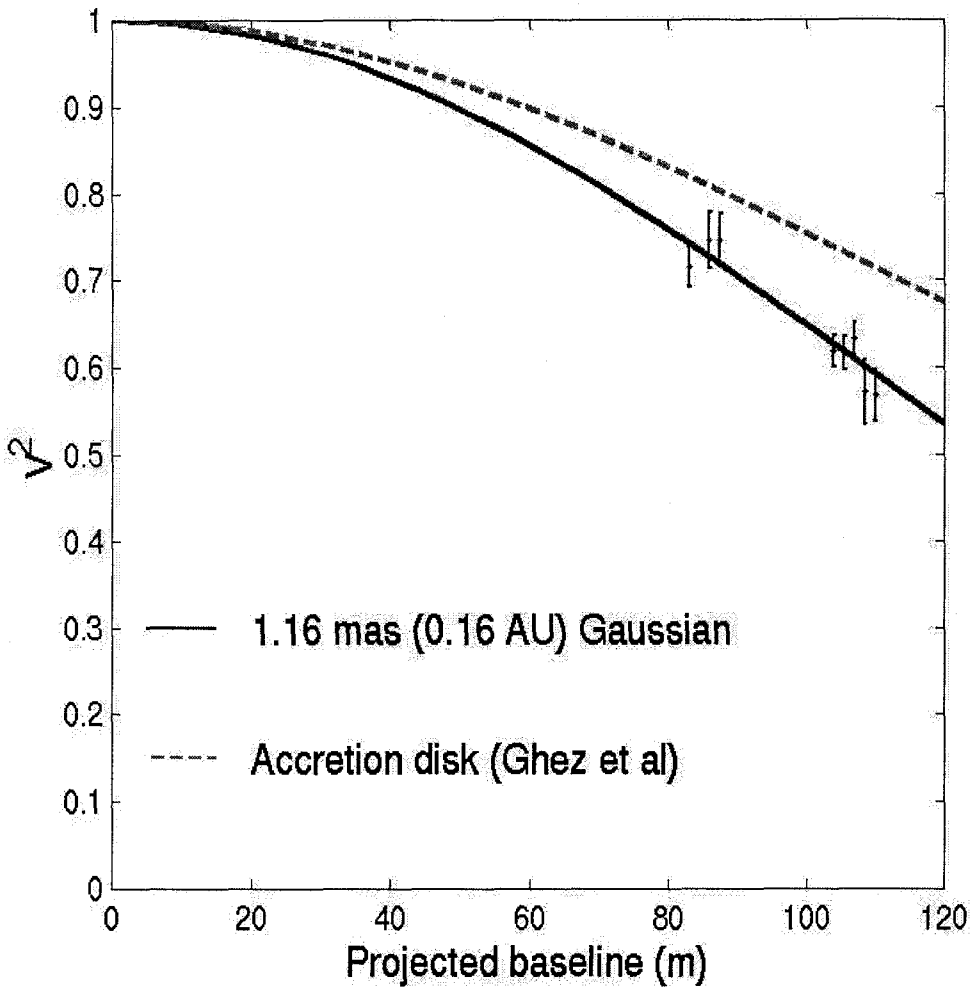
- Pre-main sequence solar-mass stars
- Ages 10^6 - 10^7 yrs
- Characteristics
  - – Hα emission
  - – infrared excess
  - – Li abundance
  - – X-ray emission
- Many thought to have circumstellar disks

HH 30 disk and jet



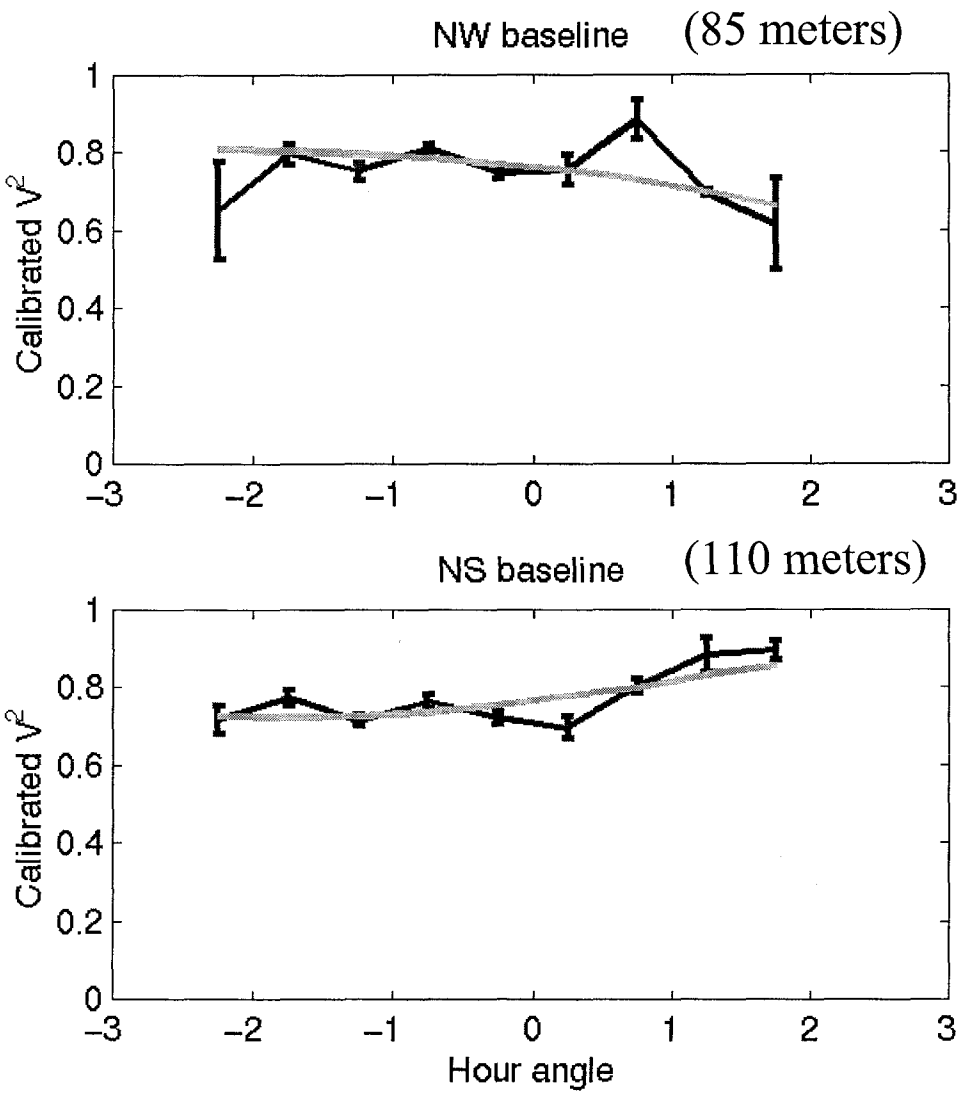
Burrows et al (1996)

T Tau



- Well-studied source in Taurus (d ~ 140 pc)
- Visibility measured for T Tau N component (origin of millimeter emission)
- Accretion disk model predicts higher V^2 (smaller size) than measured

SU Aur



- averaged by hour angle (points)
- Gaussian brightness distribution (line)
  - PA = 127° ± 5°
  - inclination = 61° ± 3°
  - 1±0.05 mas (FWHM) = 0.14 AU
- Also larger than predicted by SED model

Conclusions

- K band emission from these circumstellar disks has a size scale of ~0.2 AU
  - larger then predicted by accretion disk models
- Current work: deriving circumstellar disk parameters using this data + other wavelengths
- Future work
  - Additional sources at PTI
  - KI, VLTI